

LIVERMORE LAB REPORT

A weekly compendium of media reports on science and technology achievements at Lawrence Livermore National Laboratory, July 28-Aug. 1. Though the Laboratory reviews items for overall accuracy, the reporting organizations are responsible for the content in the links below.

Popular Mechanics THE BRAINS BEHIND MEMORY RECOVERY



Lawrence Livermore researchers will develop an implantable neural device with the ability to record and stimulate neurons within the brain to help restore memory.

A new Defense Advanced Research Projects Agency (DARPA)-supported project at Lawrence Livermore aims to build an implantable device that could electrically stimulate neurons in the hope of fighting memory loss such as that caused by Alzheimer's disease.

Alzheimer's disease slowly robs the sufferers of their most cherished memories, turning even family members into complete strangers. There is still no cure for Alzheimer's, but researchers at Lawrence Livermore are developing a tiny, implantable device that, they hope, will fight memory loss by stimulating neurons in the brain.

"The goal is to develop technologies that help maintain the memories of people who are afflicted with either traumatic brain injury or diseases like Alzheimer's -- anything that disrupts memory," said Satinderpall Pannu, project leader at Lawrence Livermore.

To read more, go to [Popular Mechanics](#).



DIAMONDS ARE FOREVER IN GIANT PLANETS



Lawrence Livermore scientists have re-created the conditions in the core of gas giants such as Saturn.

Diamond, nature's hardest material, has been crushed to record extremes of pressure using the "world's biggest laser," Lawrence Livermore's National Ignition Facility.

The carbon crystal was condensed to the core pressure of Saturn - 14 times that at the center of the Earth.

It gives clues to the conditions deep inside giant, carbon-rich planets, according to a study in the journal, *Nature*.

"We don't know what lies within the core of Jupiter or Saturn, but now for the first time we have the ability to study how matter exists under these extreme conditions of pressure and temperature," said lead author Ray Smith, of Lawrence Livermore. "Our experiments provide a method for re-creating conditions within the cores of giant gas planets -- both within our solar system and beyond."

To read more, go to the [BBC](#).



CYBER DEFENDERS DESCEND ON LAB



During the multiday Tracer FIRE training exercise, eight teams of cyber defenders from Lawrence Livermore, Sandia and a high school in Charleston, South Carolina gathered to solve a series of challenges related to protecting a power plant supervisory control and data acquisition system.

Lawrence Livermore's Celeste Matarazzo was attending a cybersecurity conference when she was struck with a realization: The field of cybersecurity had a diversity problem.

"It's about more than racial or gender diversity -- it's about diversity of thought. Both cybercrime and cybersecurity are only limited by imagination, and we as a nation can't be secure without a diverse set of problem solvers to counter the cyber threat," Matarazzo noted.

No stranger to educational outreach, she speculated that a fun yet practical introduction to cybersecurity might encourage more students to pursue careers in the discipline. In 2009, with Laboratory support, she established a Cyber Defenders summer internship program to provide hands-on training to potential future cybersecurity experts.

As intended, Cyber Defenders attracts a varied and talented assortment of scholars. This summer's 30 participants, selected from a pool of 580 applicants, include undergraduates, graduate students and even professors who represent science, engineering and humanities programs at institutions across the nation.

To read more, go to TMCnet.



THERE'S NO PLACE LIKE HOME



Steven Leahy, a Marine Corps corporal who served in Iraq, is doing computer modeling at Lawrence Livermore's National Security Engineering Division's Pulsed Power Lab.

Veterans returning home may have a hard time landing jobs. However, Lawrence Livermore recently established a program that may find them a job at the national security laboratory.

Lawrence Livermore partnered with Alameda County Workforce Investment Board and Las Positas College to establish a 24-month academic program to provide technical education and hands-on training for veterans.

The new Engineering Technology Program at Las Positas is designed to help veterans develop the skills and training needed for engineering technician careers, and establishes a pipeline of qualified candidates for LLNL and other Bay Area employers such as NASA and Sandia and Lawrence Berkeley national laboratories.

Up to 30 veterans are expected to enroll in the program when coursework begins in the fall. Some of them have started the summer internship portion of the program at Lawrence Livermore.

To read more, go to [NBC](#).



BURSTING WITH SCIENTIFIC INSPIRATION



Charles Westbrook and William Pitz have been named to the list of "The World's Most Influential Scientific Minds."

Lawrence Livermore scientists Charles Westbrook and William Pitz have been named to Thomson Reuters list of ["The World's Most Influential Scientific Minds."](#)

Westbrook and Pitz are part of the 3,000 researchers who were identified by analyzing citation data over the last 11 years to recognize those who published the highest-impact work (2002-

2012 and 2012-2013). The two were selected from their numerous research papers on combustion modeling.

Westbrook and Pitz produced a chemical kinetic study of fuel additives for engine knock in spark ignition engines, a feat that earned them the 1991 Horning Award from the Society of Automotive Engineers (SAE).

Their area of research is to develop chemical kinetic mechanisms for conventional fuels like gasoline and diesel fuel, and also for next-generation fuels, such as new types of biofuels being considered as potential replacements for fossil fuels.

To read more, go to [KLTV](#).

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance. To send input to the *Livermore Lab Report*, send [e-mail](#)